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First Records of Rhinophoridae (Insecta, Diptera) from Japan

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Abstract The dipteran family Rhinophoridae is recorded for the first time from Japan. *Acompomintho lobata* VILLENEUVE, 1927 is recorded from Ryukyu Islands, and *Oplisa japonica* sp. n. is described from Kyushu and southern Honshu. A key is provided to identify both species of Rhinophoridae and to separate these from other Japanese members of the Tachinidae family-group (Oestroidea).

Key words: Rhinophoridae; Japan; new species; new record.

Introduction

The family Rhinophoridae consists mainly of small to medium-sized non-descript species, and an unambiguous definition of the family based on characters drawn from the adult morphology has not been successfully attained (CROSSKEY 1977, PAPE 1986, WOOD 1987). Accordingly, several oestroid genera containing small species with oval or tongue-shaped lower calypteres have been considered in the Rhinophoridae. TAKANO (1950), in his conspectus of Japanese insects, lists a single species, *Halydaia luteicornis* (WALKER), in what he considered as Rhinophoridae, but *Halydaia* EGGER is currently considered a member of the subfamily Dexiinae of the Tachinidae (HERTING 1984, HIRASHIMA 1989). Critical investigations of rhinophorid genera by especially DOWNES (1986), ROGNES (1986) and PAPE (1986) have resulted in a further transfer of several genera to the Calliphoridae, including *Morinia* ROBINEAU-DESVOIDY and *Melanomya* RONDANI, which are represented in Japan with one and two species respectively (HERTING 1961, PAPE 1988). These generic transfers have left Japan with no records of native Rhinophoridae. Even though the family Rhinophoridae is rather small with only some one hundred species, of which most occur in the Mediterranean region and in South Africa, the family is distributed worldwide and was expected to occur in Japan. We take this opportunity of presenting the first Japanese records of this family.

It is our experience that the separation of Rhinophoridae from other members of the Tachinidae family-group (Oestroidea) is difficult for non-experts, and rhinophorid specimens often end up among both Tachinidae and Calliphoridae during large-scale sorting of material. To facilitate recognition of Japanese Rhinophoridae, we have produced a key ensuring the separation of members of this family from other families of the Tachinidae family-group (Oestroidea) as well as providing diagnostic features allowing the identification of the two Japanese species recorded in the present paper.

Depositories for material examined:

BPBM: BERNICE P. BISHOP Museum, Honolulu, Hawai'i

BMNH: The Natural History Museum, London

BLKU: Biological Laboratory, Kyushu University, Fukuoka

ITMN: Institute of Tropical Medicine, Nagasaki University

NIH: National Institute of Health, Tokyo

ZMUC: Zoological Museum, University of Copenhagen

Key to Japanese species of Rhinophoridae

1. Lower calypteres small and oval or slightly tongue-like, widely diverging from scutellum. Subscutellum weakly swollen [strongly convex only in the Tachinidae]. Propleuron, prosternum, metasternum and postalar wall bare. Coxopleural streak present [absent in *Melanomya* of the Calliphoridae]. Base of wing vein R_{4+5} with setulae [no setulae in *Morinia* of the Calliphoridae]. Stem vein bare Rhinophoridae.. 2
- Without this combination of character states Calliphoridae, Oestridae, Sarcophagidae, Tachinidae
2. Wing cell r_{4+5} closed and long petiolate and the bend of M forming an abrupt right-angle. Parafacial plate with strong setae in lower half. Antennal scape high above eye middle and first flagellomere long. Arista thickened on at least half its length and with second aristomere conspicuously elongated. *Acompomintho lobata* VILLENEUVE
- Wing cell r_{4+5} open at wing margin and the bend of M forming an evenly rounded and widely obtuse curve. Parafacial plate with fine hair-like setae in upper half or less. Antennal scape about level with eye middle and first flagellomere short. Arista thickened only at base and with short second aristomere *Oplisa japonica* PAPE & KURAHASHI

Acompomintho lobata VILLENEUVE, 1927

(Japanese name: Minami-tankaku-yadoribae)

Acompomintho lobata was hitherto known only from the extensive type series collected in Taiwan. It is here reported from Japan (Ryukyu Is) and South Korea.

The species has been fully described and illustrated by VILLENEUVE (1927), LOPES (1938) and HERTING (1961).

Material examined: JAPAN: Ryukyu Is, Ishigaki-jima, Kaara-yama, 1 ♂, 18. iii. 1964, Y. MIYATAKE (BLKU); SOUTH KOREA: Gyongsangbug-Do, Mt Sudosan, 1 ♂: 11. vi. 1977, 2 ♂: 2. viii. 1977, K. YAMAGISHI (first male in ZMUC, latter males in BLKU).

***Oplisa japonica* PAPE & KURAHASHI, sp. n.**

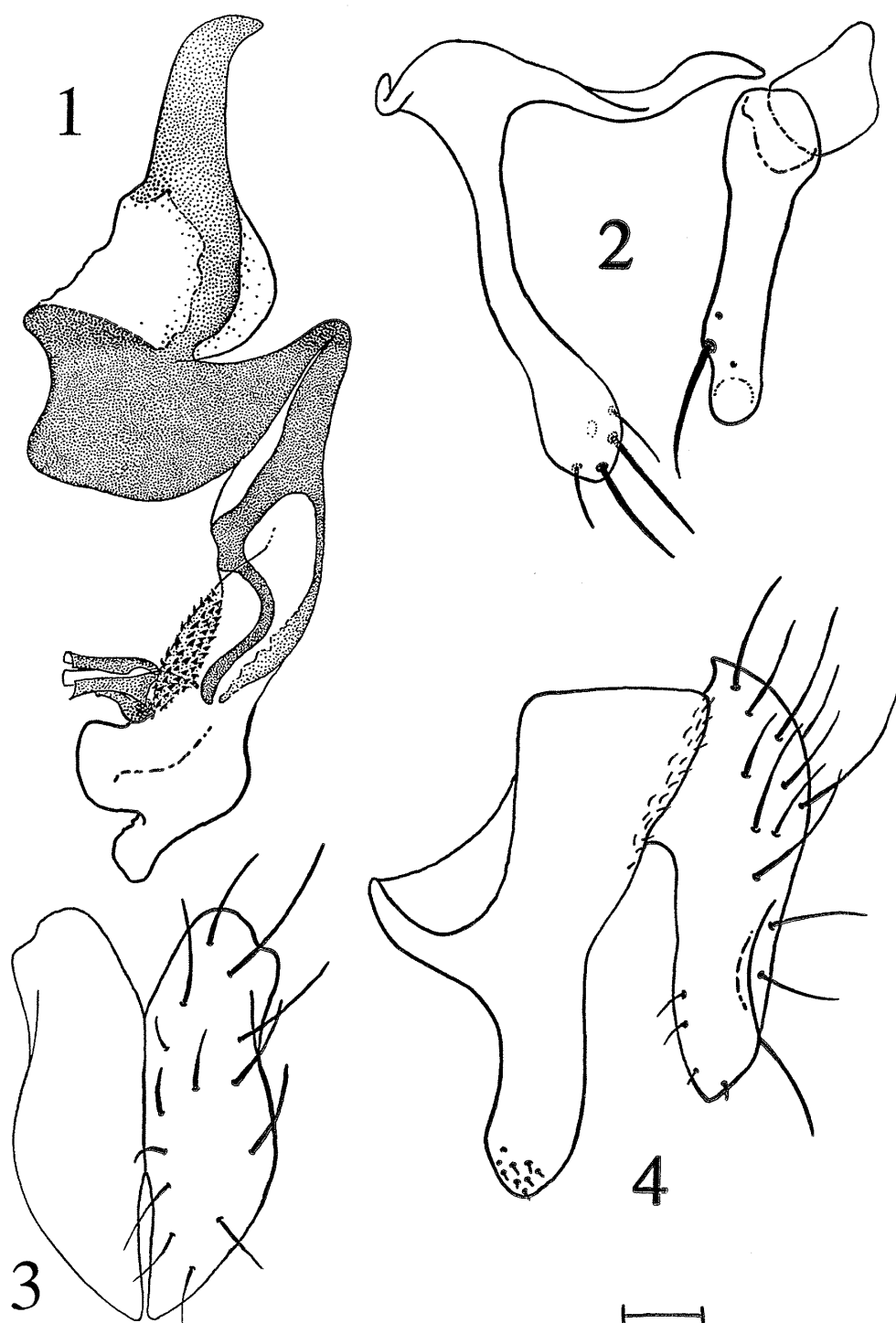
(Japanese name: Yamato-tankaku-yadoribae)

(Figs. 1–4)

Type material: HOLOTYPE ♂: JAPAN: Kyushu, Fukuoka, Aburayama, 1 ♂, 8. x. 1988, H. SHIMA (BLKU). PARATYPES: JAPAN: Honshu, 10 km N Kyoto, 1 ♂, 17–20. viii. 1989, P. S. CRANSTON, B. M. 1980–392 (BMNH); Honshu, Tokyo Prefecture, Haneda, 1 ♀, 17. vii. 199 [exact year not given], at light [the latter in Japanese on separate label; collector not given] (NIH); Kyushu, Nagasaki Prefecture, Mt Gokahara-dake, Hegi, 500 m, 1 ♂ 71 ♀, 25. ix–23. x. 1991, H. KURAHASHI (7 ♀ in BPBM, 7 ♀ in ITMN, 1 ♂ 50 ♀ in NIH, 7 ♀ in ZMUC); Kyushu, Fukuoka, Mt Tachibanayama, 12 ♂ 7 ♀: 8–14. x. 1978, 2 ♂ 8 ♀: 15–21. x. 1978, 1 ♀: 16–24. ix. 1978, K. YAMAGISHI (2 ♂ 2 ♀ in ZMUC, others in BLKU), 1 ♂ 1 ♀, 15–21. x. 1978, K. YAMAGISHI (yellow pan trap in forest) (BLKU); Kyushu, Fukuoka, Mt Inunaki, 1 ♀, 19. x. 1969, M. HONDA (BLKU).

Description.

Male.—Head. Frons broad and with a single proclinate orbital bristle. Frontal vitta narrowest just in front of anterior ocellus and slightly widening towards lunule. Frontal bristles strong, uppermost pair directed posterolaterally; ocellar bristles latero-proclinate. Frontal vitta sometimes with scattered setulae along lateral margin. Inner and outer vertical bristle well developed, inner pair a little more than 2× as long as outer pair. Fronto-orbital plate with some scattered setulae that continues as a row of fine setulae on the upper half or upper third of the parafacial plate. Vibrissa strong, genal setae well developed. Antennal arista with pubescence equal to or just exceeding arista diameter at base. Head brownish microtomentose, genal groove brown to orange, gena black. Antenna with orange scape and pedicel, first flagellomere orange at base or in proximal half. Palpus yellow to orange.—Thorax. Chaetotaxy: acr=0+0–1 (usually a pair of weak prescutellars), dc=2+3, ia=1+2, sa=3 (the middle strong, others much weaker), pa=2, h=3 (sometimes only 2 when innermost is weak or absent), inner posthumeral present, notopleuron with usual 2 bristles, otherwise bare. When 3 humeral bristles are present, they usually form a right-angled triangle. Scutellum with a pair of basal and a pair of apical bristles. Legs dark or sometimes light brown, or with coxae and trochanters distinctly lighter than remaining part.—Wing. One or two costal spines present, each spine about 2× as long as adjacent setae, node at base



Figs. 1-4. Male terminalia of *Oplisa japonica* PAPE & KURAHASHI. — 1, Phallus; 2, Gonocoxite+gonocoxital lobe; 3, Cerci, posterior view, setae of left cercus omitted; 4, Surstylus+cercus. Scale: 0.02 mm.

of vein R_{2+3} with one strong seta and sometimes 1–2 weak setae dorsally, same number ventrally but in a slightly weaker configuration. Cell r_{4+5} open.—Abdomen. Black; T1+2 with very thin microtomentum, T3 and T4 with anterior 0.25–0.35 and T5 with anterior 0.50–0.60 densely grey microtomentose. Microtomentum broken by a median black stripe, which may be somewhat indistinct on T5. T1+2 and T3 with lateral marginal bristles only, T4 and T5 with a full row of marginals. Lobes of ST5 large. Terminalia with surstylus distinctly longer than cercus and very slightly swollen distally. Cerci short and blunt, prongs not separated distally. Gonocoxite [pregonite, gonopod] very long and slender, swollen apically and carrying a row of setae along the distal margin of the swollen apex. Gonocoxital lobe [postgonite, paramere] long and slender and with a short, subapical bristly seta. Sperm pump apodeme not enlarged.

Length. 4.0–4.2 mm.

Female. In general appearance much like the male but with abdominal microtomentum more restricted. T3 and T4 with dense greyish microtomentum only in narrow anterior bands, remaining part of tergite covered with very sparse microtomentum only visible under a certain incidence of light. Ovipositor of the elongated, telescopic type.

Length. 3.2–4.1 mm.

Immatures. Unknown.

Biology. Very little information is available besides what can be read from the labels of the type specimens. The large series of females from Mt. Gokahara-dake, Hegi, were taken on spoiled meat. No males were taken on this bait. All members of the Rhinophoridae, for which larval habits are known, are parasitoids of woodlice (terrestrial isopods), and this habit may be expected for *Oplisa japonica* as well.

A large number of specimens of *O. japonica* are available, and all are collected medio July to late October.

Distribution. Palearctic–Japan (Kyushu, Honshu).

Remarks. The present record is a considerable range extension for the genus *Oplisa* RONDANI, which so far has been recorded only from Europe and North Africa (HERTING 1961).

Taxonomic discussion

When CROSSKEY (1977: 27) compared *Rhinomorinia* BRAUER & BERGENSTAMM with *Oplisa*, only three species of the latter genus were known to him. Based on examinations of *Oplisa tergestina* (SCHINER) and *O. aterrima* (STROBL), he defined *Oplisa* (sensu stricto) by the latero-reclinate ocellar setae and the greatly enlarged sperm pump apodeme. Since then, KUGLER (1978) described two additional species of *Oplisa*, *O. grandiloba* and *O. pollinosa*, both of which have anteriorly or anterolaterally directed ocellar setae like *O. oldenbergi* HERTING, and at least *O. pollinosa* has a normal-sized sperm pump apodeme (PAPE 1986). Accordingly, none

of the character states used by CROSSKEY will characterize the genus in its more inclusive definition, and PAPE (1986: 30) listed three character states in support of a monophyletic *Oplisa*: 1) distiphallus with sclerotized extensions of the lateral plate supporting the spinous membrane, 2) male cerci short and blunt, not separated apically, and 3) surstylus broadened apically. The distiphallic character is difficult to evaluate as a very similar condition is found in genera closely related to *Oplisa*, e.g. in *Stevenia* ROBINEAU-DESVOIDY and *Tricogena* RONDANI. Also, the distinction between the 'extensions' of the lateral plate and the ventral or ventromedian sclerotization ('mesohypophallus') is not entirely clear. The phallus of *O. japonica* definitely bears a strong resemblance to that seen in *O. aterrima* and *O. tergestina* (TSCHORSNIG 1985, fig. 24; PAPE 1986, fig. 27), but we cannot translate this into a clearcut synapomorphic character state. However, both of the other character states mentioned above are present in *O. japonica*, and these will serve to corroborate the generic affiliation. Note that the humeral setae of *O. japonica*, when all three are present, usually form the right-angled triangle used by PAPE (1986) to define the clade [*Stevenia*+*Tricogena*+*Oplisa*], while this species does not possess the bristly parafacial setae and the closed wing cell r_{4+5} defining the clade [*Stevenia*+*Tricogena*].

No key to species of *Oplisa* has been produced as this falls outside the scope of the present paper. No specimens of *Oplisa oldenbergi* have been available for examination, and the nominal taxon *Oplisa caesia* VILLENEUVE is in need of a critical revision (type material lost according to Herting [1961]). *Oplisa japonica*, however, is easily differentiated from both *O. tergestina*, which has latero-reclinate ocellar setae, and *O. aterrima*, which has latero-reclinate ocellar setae and a wing vein M with the bend missing. *Oplisa grandiloba* has the entire parafacial plate setose, while this is setose only in the upper half or upper third in *O. japonica*. *Oplisa oldenbergi* and *O. pollinosa* have 1–2 presutural acrostichal bristles while *O. japonica* never shows any differentiated presutural acrostichal bristles.

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